mentioned by Dembowski in *A.N.* 1823—proper motion of one component is no doubt here also the cause of change.

These catalogues of double-star measures made at the Temple Observatory are meritorious productions from an institution not exclusively devoted to a regular course of observations, but also occupied in endeavouring experimentally to interest the youths of the school in astronomical science, with the hope that some, to use the words of the last Annual Report of the Royal Astronomical Society, "may hereafter join that band of amateurs to whom is owing much of what is most characteristic of English astronomy."

While referring to this Report it occurs to us to mention an article by O. Struve on the Baron Dembowski's long series of measures of double stars which is not noticed in the address of the President of the Society, on the occasion of the richly-merited award of the gold medal to the Italian astronomer. It is published in vol. viii. of the *Vierteljahrsschrift der astronomischen Gesellschaft.* After a general outline of the Baron's work, there is given an index to the volumes and numbers of the *Astronomische Nachrichten,* in which his measures have appeared, and which, though not entering into much detail, is useful in their present scattered state. Is it too much to hope that eventually the results of the indefatigable Gallarate observer, may be presented in a collective form, at least as regards their annual means?

SCHMIDT'S LUNAR CHART.—It is understood that this great work, which has been engraved at the expense of the Prussian Government, will, with accompanying letterpress description, be ready for issue in the course of a few weeks. We believe Prof. Auwers, of Berlin, is superintending its publication.

TEMPEL'S COMET OF SHORT PERIOD (1873 II.).—It is probable that the period of revolution of this comet, determined by Mr. W. E. Plummer, from observations extending from July 3 to October 20, will not be found to require very material correction; according to his orbit, the comet cannot attain the distance of Jupiter in its aphelion, and as at the last passage through this point, the planet was distant from it 7·70 (the earth's mean distance = 1) perturbations during the actual revolution are likely to be small. Assuming, then, with Mr. Plummer, that the revolution occupies 1,850 days, the comet may again arrive at perihelion about July 19·5 in the present year. Reducing the perihelion and node to 1878·0, we have the following expressions for the comet's heliocentric co-ordinates referred to the equator:—

$$\begin{aligned} x &= r\,[9{\cdot}99212]\sin(v + 36^\circ\ 51'{\cdot}8) \\ y &= r\,[9{\cdot}98170]\sin(v + 310\ \ 7{\cdot}9) \\ z &= r\,[9{\cdot}53313]\sin(v + 274\ 53{\cdot}1) \end{aligned}$$

Combining the co-ordinates thus found with the X, Y, Z of the *Nautical Almanac,* and taking July 19·5 for the time of perihelion passage, the following apparent track results:—

12h. G.M.T.

	Right Ascension.	North Polar Distance.	Distance from Earth.
April 20	281° 1′	95° 56′	1·025
May 20	297 53	93 50	0·708
June 19	316 7	95 12	0·488
July 19	334 42	104 56	0·376
August 18	347 22	118 45	0·397

The comet would be nearest to the earth on July 29, and brightest about that date. With such a course it should be well observed. Though, possibly, observations may have been made later than October 20 in 1873, so far as we know none such have been published. Mr. Plummer's elements will be found in the *Monthly Notices* R.A.S. for December, 1873.

[Since the above was written, we learn that Herr Schulhof is engaged upon this comet, with the view to providing an ephemeris for the approaching appearance.]

GEOGRAPHICAL NOTES

AMERICAN LONGITUDES.—The United States Hydrographic Office is continuing the work of establishing secondary meridians of longitude by the electric telegraph. Lieut.-Commander F. M. Green, U.S.N., with the same officers who have been engaged in similar work in the West Indies for some time past, has commenced the determination of South American meridians by measuring from the Royal Observatory at Lisbon through the cables of the Brazilian Submarine Company to Madeira and St. Vincent. The measurement will be continued by way of Pernambuco to Bahia, Rio de Janeiro, Buenos Ayres, and Valparaiso. The longitude of the Royal Observatory at Lisbon will shortly be determined with great exactitude by electrical measurement from London and Paris. The expedition has met with the most gratifying and cordial assistance from the officers of the Portuguese Government and the authorities of the telegraph companies.

NEW GUINEA.—The statement that gold has been discovered in New Guinea by Mr. Goldie, a plant-collector sent out by Messrs. Williams and Co., has caused considerable excitement in the Australian Colonies, but a letter in yesterday's *Times,* from the Rev. W. G. Lawes, who has just returned from a three years' residence on the south-east coast, ought to make would-be gold-hunters cautious. As yet the metal has been found in almost infinitesimal quantities, and we heartily support Mr. Lawes' recommendation that Government ought to take some means to prevent a rush of adventurers who would be sure to demoralise the people, and change to hostility their present decidedly friendly disposition towards white men. It is for the interests of the scientific exploration of the country that this friendly disposition should be maintained. We may state that Mr. C. S. Wilkinson, Government Geological Surveyor of New South Wales, inferred two years ago, from the rock specimens brought back by Mr. Macleay, that gold would probably be found in New Guinea, but he refrained from publishing the fact, he states, fearing it might cause a rush. Mr. Wilkinson states that gold is not likely to be found more plentifully in New Guinea than in the vast auriferous formations of New South Wales.

AFRICAN EXPLORATION.—Dr. Emin Effendi, who in 1876 travelled with Gordon Pasha to the Somerset River, sends from Mruli to Dr. Petermann, a sketch dated November last, of his second journey from Magungo on the Albert Nyanza, across Kirota and Masindi to Mruli in August last, and from Mruli to Mpara-Njamoga, in the south of Masindi, and back to Mruli (in September and October). Sir Samuel Baker, it will be remembered, found Kaba Rega, the lord of Ungoro, utterly intractable; but Dr. Emin Effendi spent a month alone with him, showing the impossibility of anticipating the chances of such travels. In November Dr. Effendi was to go from Mruli to Uganda and Karague, and thence, according to Gordon Pasha's desire, to reach, if possible, Lake Akanyaru, the Mfumbiri Mountains, and Ruanda.

ARCTIC EXPLORATION.—The U.S. Senate has passed the Bill for allowing the *Pandora,* which has been chartered by Mr. James Gordon Bennett for an Arctic Expedition, to sail under the American flag, and for permitting United States naval officers to be detailed for service on board that vessel during the proposed expedition.

PETERMANN'S MITTHEILUNGEN.—As a sequel to a former paper on the distribution of the sedimentary formations of Europe, Petermann's *Mittheilungen* for March contains another on Europe during the two glacial periods, accompanied by a map. The paper on the distribution of palms is concluded, and the first instalment of a summary of exploration of the Ogové given, accompanied by a map.

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The April part will contain a long paper, with map, by Prof. Hertzberg, on the Ethnology of the Balkan Peninsula in the fourteenth and fifteenth centuries, and the conclusion of the paper on Prof. Nordenskjöld's proposed expedition from Norway to Behring's Straits. There is also the itinerary (with map) of a journey between Ozaka, Kioto, Nara, and Ominesanjo, in Nippon, Japan, by Dr. Knipping.

AMERICAN GEOGRAPHICAL SOCIETY.—In the *Bulletin* of the Society, No. 5 (1876-7) will be found a pretty full account of the work of the American Palestine Exploration Society, by Dr. Merrell, and a paper on a trip up the Magdalena, and among the Andes, by Mr. J. A. Bennett, U.S. Consul at Bagotá. At the meeting of the society on February 27, the president, Chief-Justice Daly, gave his annual address, summing up in an interesting and complete manner the geographical work of the past year.

BERLIN GEOGRAPHICAL SOCIETY.—The fiftieth anniversary of the foundation of this Society will be celebrated in the Kaisersaal of the Flora. The Crown Prince of Germany, several ministers, and numerous foreign guests, are expected to be present at the festival, which will begin on April 31. The last three numbers for 1877 of the *Verhandlungen* of this Society contain some papers which may interest geographers and ethnologists. Among these (in No. 8) are a paper by Prof. Virchow on "The Anthropology of America," and in the same number a paper on "The Hygiene of the Tropics," by Herr Falkenstein; in No. 10 a paper by Dr. Hildebrandt on his travels in East Africa, in his attempt to reach Mounts Kenia and Kilima-Njaro, to which we have already referred.

SUMATRA.—The Dutch Geographical Society has recently received important news from the Expedition in Sumatra. MM. van Hasselt and Veth report that in the course of their exploration of the southern highlands of Padang, they ascended the Peak of Indrapura, the highest mountain in Sumatra. From the summit of this volcano they had an extensive view over the land and lakes of Korintji. The travellers also report that of late they had met with less enmity on the part of the independent chiefs than at the outset of their expedition.

NOTES

DURING the field operations of one of the parties connected with the U.S. Geological Survey of the Territories, in charge of Prof. F. V. Hayden, portions of south-western Colorado, north-western New Mexico, and north-eastern Arizona, were traversed, embracing that broken-up country occupied in remote times by a race of people who were known as the cliff-dwellers. This subject is well known to readers in general, but we must recur to it again so as to be able to reach the importance of the discovery to be described. In one of the cañons, known as the Chaco, Mr. H. W. Jackson made detailed investigations and measurements of the immense ruined buildings. In one of the arroyas or dry water-courses, the sectional view of the alluvial deposit was exposed to a depth of about sixteen feet. Fourteen feet beneath the surface, a layer of pottery and *débris* came to view. This may not seem strange, as, in a comparatively narrow valley, dirt and gravel to the depth of fourteen feet might be deposited in a short term of years. But ten feet above this layer the foundation walls of ancient buildings were visible, built upon another layer of gravel and sand. These were in time covered with the alluvium upon which now stand the famous ruins, of which no history is extant, and of the builders of which no history will ever be known. How many ages have passed since the lower or first bed was the surface upon which moved the numerous hordes, of which all evidence at present is hidden behind the veil of the dark past? Now, a skull comes to view upon the layer of pottery, which is beneath two eras of occupation and semi-civilisation. This skull, in its contour, is unique. Its closest relations are the ancient Mexicans, Peruvians, Caribs, and Natchez. There is an extraordinary flattening of the upper posterior portion of the head (posterior parietal), which is evident in those figured in Morton's *Crania Americana*. The contents of the skull as found, consists of sand, which is now as hard as ordinary agglutinated sandstone, and has, in nearly all portions, the appearance of liminite. The skull will be described and figured by Dr. W. J. Hoffmann, of the U.S. Survey, and it affords another strong link in the chain of facts and hypotheses of the cliff-dwellers and the ancient Mexicans being more nearly related than is generally admitted or supposed.

MR. PARK HARRISON telegraphs to us from Worthing that he has just (yesterday) exhumed, at Cissbury, a contracted skeleton, sixteen feet deep, lying in the centre of the pit, over which the cist was found last autumn. The work will be continued on Saturday and next week.

A SCRUTINY took place on the 18th instant at the Academy of Sciences for the nomination of a successor to M. Leverrier as member of the section of astronomy. The successful candidate was M. Tisserand, the Director of Toulouse Observatory, who took thirty-two votes out of fifty-five, against M. Wolf. M. Tisserand was the second astronomer of the Japan Mission for the Transit of Venus, which was led by M. Janssen.

AS we have already stated, a subscription list has been opened in France for the foundation of a memorial to Claude Bernard. A small sub-committee has been formed to obtain subscriptions in this country, consisting of Sir James Paget, Dr. J. Burdon Sanderson, Prof. Humphry, Dr. Michael Foster, Mr. Ernest Hart, Mr. Romanes, and Prof. Gerald Yeo, King's College, to the latter of whom, as honorary secretary of the Physiological Society, subscriptions may be sent.

PORTER AND COATES of Philadelphia are about to bring out a new and cheap edition of Wilson and Bonaparte's "American Ornithology," three volumes in one, together with 103 new plates.

THE report of Major Feilden, the naturalist of the Arctic Expedition, is now nearly completed, and will shortly make its appearance as a Parliamentary Paper, together with some interesting additional remarks by Sir George Nares.

GENERAL DE NANSOUTY published in the beginning of March a letter stating that a sum of 20,000 francs was required to complete the Pic-du-Midi Observatory, of which he is director. Three days after the publication of his letter in the *XIXme Siècle*, an inhabitant of Calais sent him 5,000 francs, and five days later he was presented with a sum of 15,000 francs by M. Bischofsheim, the eminent Parisian banker, whose generosities to science we have so often to record.

Brownea grandiceps is producing its fine *Rhododendron*-like heads of flowers in No. 1 house at Kew.

KING HUMBERT of Italy has granted four annual prizes of 5,000 lire each (about 190*l.*) for the best productions in art, science, and literature. The Academia dei Lincei, at Rome, is charged with the annual award and distribution of these prizes.

A COMPETITIVE trial of German and Swiss chronometers took place recently at the Deutsche Seewarte at Hamburg, by order of the German Admiralty. The best instrument was furnished by Herr Bröcking, and its performance is said to be superior to that of any chronometer examined at Greenwich during the last three years.

MAJOR-GENERAL SIR HENRY RAWLINSON, K.C.B., F.R.S., and Sir John Lubbock, M.P., F.R.S., have been appointed trustees of the British Museum in the place of the late Right Hon. Sir David Dundas and the late Sir William Stirling Maxwell.

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